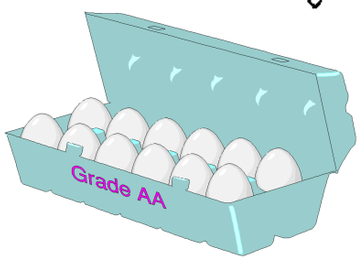
My Water Smells Like Rotten Eggs!

NAVAJO COUNTY HEALTH DEPARTMENT
117 E. Buffalo
Holbrook, AZ 86025 928-524-4750



In Service to the citizens of Navajo County

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COMMON WATER PROBLEMS & TREATMENT

SYMPTOM	PROBABLE CAUSE	SUGGESTED REMEDY
Sudsy lather difficult to maintain in wash basin; greasy ring in bathtub; scale develops in pipeline and restricts flow of water	Hard water due to calcium and magnesium compounds dissolved from rocks and minerals in the earth	Install a water softener to remove calcium and magnesium compounds
Fluffy brown sediment in standing water; reddish-brown stains in sinks, toilets, and bathtubs, water has metallic taste.	Dissolved iron in ground water oxidized by air in pressure tank forms an insoluble rusty iron oxide	Install a polyphosphate feeder; or high capacity water softener recommended for iron removal
Reddish slime on walls of toilet flush tank; slimy material suspended in clear water, reduced pumping capacity	Iron-eating bacteria live in pipes, produce slimy material which hardens into scale	Disinfect well with chlorine bleach solution; if condition persists, install chlorinator & sand filter
iIron pipe rusts; water dripping from faucet has rusty odor, copper tubing corrodes at joints; blue-green stains on sink	Low pH or high concentration of carbon dioxide; possible acidic drainage	Use calcium carbonate neutralizing filter plus water softener, or feed soda ash solution into system
Rust Particles or black specks suspended in clear water	Oxidized iron or manganese compounds	Install removable cartridge filter or sand filter with adequate backwash capacity
Water feels greasy; black stains in sink	Iron and/or manganese sulfides	Install removable cartridge filter or sand filter with adequate backwash capacity
Rotten-egg odor	Hydrogen sulfide, sulfur, or sulfate-reducing bacteria in ground water	(See otherside of this flyer)
Rotten-egg odor in hot water only	Chemical reaction of anti-corrosion magnesium rod in hot water heater	Remove or replace magnesium rod
Objectionable taste or odor other than hydrogen sulfide	Decaying organic matter; pollution from surface drainage; insufficient chlorine being used to disinfect	Install activated carbon filter or automatic chlorinator followed by an activated carbon filter
Turbid, cloudy, or dirty water	Suspended particles of silt, clay, and colloidal matter	Install cartridge-type sediment filter or automatic sand filter
Water unsafe or not potable; fecal coliform bacteria	Contamination due to sewage, manure, or surface water	Disinfect well or supply source with bleach solution; if condition persists install chlorinator. May need to install new well or replace/repair septic system.

ARIZONA COMMERCIAL LABORATORIES CERTIFIED FOR DRINKING WATER SAMPLES

MOHAVE ENVIRONMENTAL (IN NAVAJO COUNTY)
119 E. HOPI
HOLBROOK, AZ 86025 (928) 524-4635

SEVERN TRENT ENVIRONMENTAL (IN GILA COUNTY)
3788 HIGHWAY 87
PINE, AZ 85544 (928) 476-4189

NORTEST ANALYTICAL (IN COCONINO COUNTY)
2400 E. HUNTINGTON DRIVE
FLAGSTAFF, AZ (928)774-8708

The Problem: Hydrogen Sulfide

One of the common problems with water that contains sulfur is the formation of a foul-smelling gas called **hydrogen sulfide** (represented by the chemical symbol H_2S). The rotten egg odor is a natural process involving sulfur, a common sulfate-reducing bacteria, and corrosion. Corrosion within plumbing fixtures releases electrons (similar to the chemical reactions taking place in a car battery). The electrons provide the energy source for the bacteria to reduce the sulfur. One of the results is the formation of the hydrogen sulfide gas.

The concentration that occurs in your water system is not considered harmful.

It is definitely an unpleasant nuisance: it is unpleasant to wash, drink, or bathe in water that reeks of decay and rotten eggs.

The bacterial activity can accelerate the very corrosion that started the process, especially in unprotected water mains and household plumbing. More corrosion releases more electrons which creates more H_2S gas. Chlorine can help stop the growth and many cities and private wells are equipped to add chlorine. Even chlorine is not a cure-all if stagnant conditions exist: Dead-end water mains and little used household plumbing lines can allow the bacteria to grow. Other problems include iron plumbing, poorly maintained water softeners, and infrequent use of your hot water. Loss of water pressure for extended periods can also contribute.

Your hot water heater may be the source of the odor.

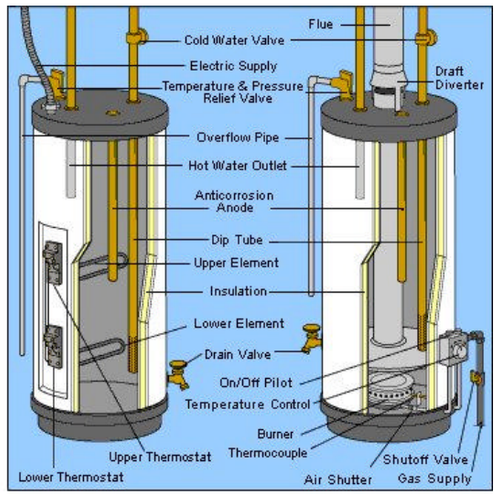
Water Heaters can provide ideal conditions for the growth of the bacteria that forms the hydrogen sulfide gas. Glass is often used to line the inside of the steel tank to prevent corrosion. Since the glass lining itself may contain hairline cracks, a long rod of metal, usually magnesium, is installed in the tank and functions as an anode. The magnesium is "sacrificed" to protect the steel tank and keep the tank itself from corroding. The problem results when an excess of electrons are released by the magnesium over that needed to protect the tank. The 'extra' electrons now provide the energy for the bacteria to produce the foul-smelling gas (this is why a brand-new hot water heater can create this problem!) If the rotten egg odor is only present in your hot water and not in your cold water, your hot water heater may be the source of the problem.

SUGGESTED REMEDIES

***Contact a professional before attempting any of the suggested remedies.**

(1) *CHLORINATION.* Maintaining a chlorine residual of 1 mg/L (one milligram per liter) throughout the system will oxidize any hydrogen sulfide gas present and also inhibit the bacteria and corrosion. In a non-chlorinated system, periodic disinfection & flushing of the hot water tank with a chlorine solution may be sufficient. If the problem is severe, a chlorine feeder system may be required and can be installed if allowed by Law.

(2) *REPLACE THE MAGNESIUM ANODE.* Check with a water utility or a water heater/plumbing supply dealer for a replacement anode that will work with your hot water heater. **Zinc** has an electrode potential close to steel and won't surrender as many electrons as magnesium. This may reduce the problem. Also, check and see if you need the anode at all. This is not a preferred method since you will remove the protection and may shorten the life of the tank. Water softeners can increase the corrosive nature of your water which may speed up tank corrosion if you remove the anode.



NOTE THE ANTI-CORROSION ANODE

(3) *KILL THE BACTERIA WITH HEAT.* Temperature of 140° F will kill the sulfate-reducing bacteria. Most hot water heaters are factory set between 130° F and 150° F (check your owner's manual to be certain). Flush the tank, refill, then increase the temperature to 160° F for several hours, then flush and refill. **CAUTION!** The hot water tank must have an operable pressure relief valve. The temperature **must** be reduced after treatment to prevent scalding water in the hot water taps. If you want to kill the bacteria by increasing the water temperature **keep children away from the water fixtures!** If you are the least bit unsure of the condition of your tank or your ability to use the heat method for treatment, **hire a specialist to check your system for you!**

How to Disinfect your private well.

To disinfect the average private well, mix two quarts of household bleach containing (5.25% sodium hypochlorite) in 10 gallons of water. Be sure to use an unscented brand of bleach. Pour the solution into the well. Go to each faucet and turn on the water. Wait until you smell the chlorine (the familiar 'bleach' smell). You might need a second person to 'smell' and the other to pour the bleach. If you do not smell bleach, you may need to add additional bleach and water to the well. When you smell bleach at a fixture, turn it off. The goal is to introduce chlorinated water throughout your distribution lines. If you have a pressure tank, open the valve or plug on top the tank to allow bleach to come in contact with the inside of the tank. Mix one more quart of bleach in 10 gallons of water and pour into well. Allow the well to stand idle for at least 24 hours then pump to waste. Do not discharge the chlorinated water into your septic system or onto your lawn or garden. You may want to discharge the chlorinated water back into the well between the casing and drop pipe during the first 30 minutes of pumping to disinfect the casing. Do not be surprised to see a lot of 'sludge' being discharged, especially if you have never disinfected your well before. Also, do not overload with excess bleach . . . You may damage your system by adding too much bleach. If you are the least bit unsure, **hire a specialist to disinfect your private well system for you!**

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